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AMENDED CLAIMS, July 2000

1. A method of modifying a substrate material by means of a bacterial culture which is capable of being metabolically active in said substrate, whereby the bacterial culture is not susceptible to attack by bacteriophages, the method comprising

(i) isolating a bacterial strain which is not capable of DNA replication, RNA transcription or protein synthesis in said substrate material but is capable of metabolically modifying the substrate material,

(ii) propagating the selected strain in a medium wherein the strain is capable of replicating to obtain a culture of said strain,

(iii) adding the thus obtained bacterial culture to the substrate material and keeping the material under conditions where the culture is metabolically active.

whereby, if the substrate material is contaminated with a bacteriophage, the metabolic activity of the bacterial culture is substantially unaffected by the bacteriophage.

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2. A method according to claim 1 wherein the substrate material is limited with respect to at least one compound that is required by the bacterial strain for DNA replication, RNA transcription or protein synthesis.

3. A method according to claim 2 wherein the bacterial strain is a mutant strain being auxotrophic in respect of a compound which is not present in the substrate material and which is required by the strain for replication.

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4. A method according to claim 3 wherein the mutant strain is a *Pur* mutant including *Lactococcus lactis* strain DN105 deposited under the accession number DSM 12289.

5 5. A method according to claim 3 wherein the mutant strain is a *thyA* mutant including *Lactococcus lactis* strain MBP71 deposited under the accession number DSM12891.

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6. A method according to any of claims 2 to 5 wherein the strain in said substrate material is not capable of performing at least one activity selected from the group consisting of DNA replication, RNA transcription and protein synthesis.

7. A method according to claim 1 wherein the substrate material contains at least one compound that inhibits the DNA replication, RNA transcription or the protein synthesis of the bacterial strain.

8. A method according to claim 1 wherein the substrate material is a starting material for an edible product, the material is selected from the group consisting of milk, a vegetable material, a meat product, a must, a fruit juice, a wine, a dough and a better.

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9. A method according to claim 1 wherein the bacterial culture is selected from the group consisting of *Lactococcus* spp., *Lactobacillus* spp., *Leuconostoc* spp., *Pediococcus* spp., *Streptococcus* spp., *Propionibacterium* spp., *Bifidobacterium* spp., *Staphylococcus* spp., *Micrococcus* spp., *Bacillus* spp., *Enterobacteriaceae* spp. including *E. coli*, *Actinomycetes* spp., *Corynebacterium* spp. and *Brevibacterium* spp.

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10. A method according to claim 9 wherein the bacterial culture is of *Lactococcus lactis*.

11. A method according to claim 1 wherein the bacterial strain is added to the substrate material at a concentration in the range of 10^5 to 10^9 CFU/ml or g of the material.

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12. A method according to claim 1 wherein the culture comprises a genetically modified strain which, relative to its parent strain is enhanced in at least one metabolic pathway.

5 13. A method according to claim 12 wherein the genetically modified strain has, relative to its parent strain, an enhanced metabolic activity selected from the group consisting of enhanced glycolytic flux and enhanced flux through the pentose phosphate pathway.

10 14. A method according to claim 13 wherein the genetically modified strain has, relative to its parent strain, an enhanced ATPase activity.

15. A method according to claim 1 wherein the bacterial culture comprises a strain which is a conditional mutant which at a predetermined condition does not perform
15 at least one activity selected from the group consisting of DNA replication, RNA transcription and protein synthesis.

16. A method according to claim 15 wherein the predetermined condition is selected from the group consisting of pH, temperature, composition of the substrate material
20 and presence/absence of an inducer substance.

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17. A method according to claim 1 wherein the culture comprises a bacterial strain which is capable of increasing the size of the cells without mitosis.

25 18. A modified lactic acid bacterium that is modified to become incapable of performing DNA replication, RNA transcription or protein synthesis in a specifically defined substrate material which is limited with respect to at least one compound that is required by the bacterial strain for DNA replication, RNA transcription or protein synthesis, said modified bacterial strain is capable of being metabolically active in
30 said substrate material, whereby the strain is not susceptible to attack by bacteriophages, subject to the limitation, that the lactic acid bacterium is not a strain selected from the group consisting of strain DN101, DN102, DN103, DN104 and DN105 (DSM12289).

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19. A lactic acid bacterium according to claim 18 wherein the bacterial strain is a mutant strain being auxotrophic in respect of a compound which is not present in the substrate material and which is required by the strain for replication.

5 20. A lactic acid bacterium according to claim 19 wherein the mutant strain is a *thyA* mutant including *Lactococcus lactis* strain MBP71 deposited under the accession number DSM12891.

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10 21. A starter culture composition comprising the lactic acid bacterium of any of claims 18-20.

22. A starter culture composition comprising a lactic acid bacterium obtainable by the method according to claim 1 in combination with at least one further lactic acid bacterium.

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23. A composition according to claim 22 which further comprising at least on component enhancing the viability of the bacterial active ingredient during storage including a bacterial nutrient or a cryoprotectant.

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20 24. A method of manufacturing a food or feed product comprising adding a starter culture composition according to any of claims 21-23 to a food or feed product starting material and keeping the thus inoculated starting material under conditions where the lactic acid bacterium is metabolically active.

25 25. A method according to claim 24 wherein the food product starting material is milk.

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30 26. Use of a culture as obtained in the method of claim 1 or a lactic acid bacterium according to any of claims 18-20 as a starter culture in the preparation of a product selected from the group consisting of a dairy flavour, a product for cheese flavouring, a food product and a feed product.

27. A method of preventing that a lactic acid bacterial starter culture is infected by bacteriophages in the manufacturing of a food or feed product, the method

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comprising adding as a starter culture a lactic acid bacterium obtained by the method according to claim 1 to a food or feed product starting material which is limited with respect to at least one compound that is required by the bacterial strain for DNA replication, RNA transcription or protein synthesis and keeping the thus inoculated

5 starting material under conditions where the lactic acid bacterium is metabolically active, whereby, if the substrate material is contaminated with a bacteriophage, the metabolic activity of the bacterial culture is substantially unaffected by the bacteriophage.

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